GUIDANCE NOTE SERIES

«ACCELERATING TO ENERGY-EFFICIENT PRODUCTS BY PRODUCT REGISTRATION SYSTEMS»

GUIDANCE NOTE 3

PLANNING TO BUILD – DETAILED CONSIDERATIONS

United Nations Environment Programme – Global Environment Facility | United for Efficiency (U4E)

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Introduction

THIS GUIDANCE NOTE IS PART OF A SERIES OF TOOLS OF UNITED FOR EFFICIENCY ON PRODUCT REGISTRATION SYSTEMS.

GUIDANCE NOTES

OTHER TOOLS IN THIS SERIES INCLUDE:

PROTOTYPE

This guidance note is the third of a series of guidance notes prepared by United for Efficiency (U4E) and aims to cover important items of detail that need to be considered during the development of a product registration system. Foundational issues that should be considered are explained in the previous guidance note, number 2.

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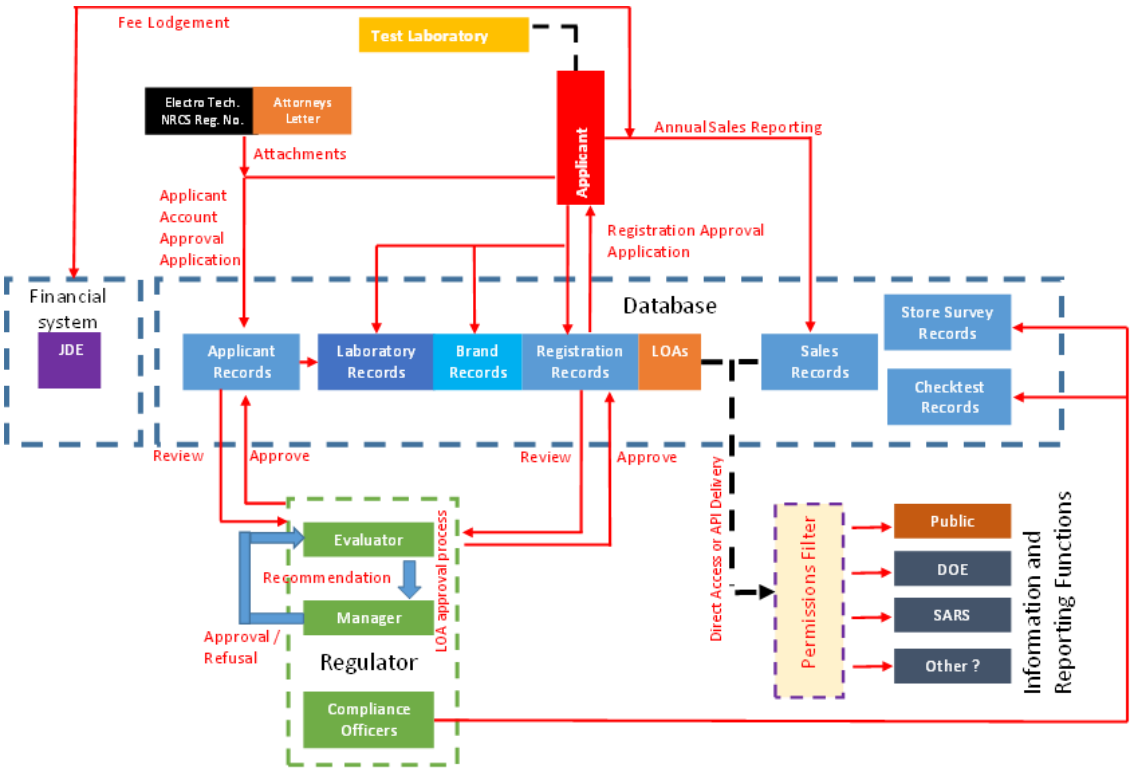
1. Applicable Business Rules

Firstly, business rules (i.e. the framework of rules and procedures) governing the operation of a standards and labelling program must be considered when setting up a Product Registration System.

Within established standards and labelling programmes, such rules are likely to be already well defined in documents such as governing legislation and regulations, regulatory standards and standard operating procedures within the regulator's office. If it is planned to introduce a new Product Registration System into an established programme it is essential to familiarise first with the above-mentioned documentation, in particular it should be verified if there are any legal requirements. Whenever possible, a Product Registration System should strive to operate within the pre-existing framework of business rules, particularly the governing legislation. Though, stakeholders should keep in mind that it might be unavoidable that existing business rules are modified to assure the success of a Product Registration System. In newer, emerging standards and labelling programmes, such rules may not yet be fully formed, in these circumstances the developers of a Product Registration System will have a role in helping to form those business rules in consultation with key stakeholders.

The process diagram below shows the case of South Africa, outlining how the various stakeholders interact in relation to the business rules in the context of a Product Registration System. Development of such a schematic representation can prove helpful when designing a product registration system.



Legend
API = Application Programming Interface
DOE = Department of Energy (South Africa)
JDE = JD Edwards application support system
LOA = Letter of Authority (sometimes also called a "certificate of approval")
NRCS = National Regulator for Compulsory Regulations (South Africa)
SARS = South African Revenue Service
Scope of Data Collection

Figure 1: Product Registration System Process diagram (South Africa)

To limit the administrative burden on industry and regulators, a Product Registration System should aim to collect the minimum possible amount of data from applicants. The main objectives of the data collection is to ensure that:

- The product, its supplier and the entity responsible for the testing and or certification of the product can be clearly identified and contacted if required.
- The product meets the performance requirements as set out in the regulations.
- Other relevant claims (such as those on its energy label) made by the supplier are valid.
- Consumers have sufficient data on which to base their purchasing decisions.[1]

2. Data Sharing Requirements (access privileges)

As noted in Guidance Note 1 information contained within a Product Registration System may be public or private in nature. Some information contained within a Product Registration System may be commercially sensitive (as for example test reports) or may be privileged information in some way (for example a regulators internal risk assessment of particular suppliers' products). In setting up a Product Registration System it is essential that rules around access to data are developed in consultation with various concerned stakeholders including; regulators, customs officials, manufacturers and importers, policy makers/researchers and consumer groups.

Some key questions to consider are:

- What information does the regulator need in order to assure that a product meets the legal requirement of the programme? (e.g. copies of test reports)
- What information do customs officials need in order to assess a products' compliance or before allowing it to pass the border? (e.g. details of approval dates and certificate of approval)
- What information does the public need to enable informed decisions about a products' energy efficiency (this may extend beyond what is legally required)? (e.g. product performance claims, characteristics and features)
- What data supplied by registrants is likely to be commercially sensitive and therefore should be excluded from the public domain? (e.g. details of other identical products sold under different brand names/model numbers)

3. Relevant Legal Issues

The establishment of a Product Registration System typically raises several legal issues for consideration. Such consideration should be informed by the enabling legislation/regulations and ideally with the assistance of a governments' legal counsel.

Some key items for consideration include:

- Will the approval of a registration application for a product confer a right on anyone to import/sell that product or only a right for the applicant?
- Are imports of second-hand products to be covered by the scheme?
- Are products offered for rental use required to be registered? (E.g. A rental agency which imports the product directly as an offer to rent without sale in the country itself.)
- Will applications lodged electronically be legally valid in your jurisdiction?
- What documentation must legally accompany an application?

[1] Data that establishes a products' compliance with the regulations may in some cases be insufficient by itself for consumer needs. For example the MEPS requirement for a television is based in part on the area of the screen (e.g. 4300 cm^2). Such a metric whilst useful in establishing if the product meets MEPS or not is of little value to the consumer who would rather know the diagonal dimension of a TV (e.g. 90cm) when considering which products to consider. Consequently it is important that both pieces of data are collected by a PRS.

- What form of declaration needs to be included at the end of an application form? (Generally, these are declarations where the content of the application is true and where the applicant is empowered to make such a declaration.)
- Are fees to be levied against a registration application and if so at what stage? On submission? On approval?
- If fees are levied, will they be paid at once or as an annual payment? How will payments be evidenced?
- Does the regulator have the legal right to collect companion data from the applicant such as sales numbers or average sales price by product per annum?
- Do the regulations account for the fact that from time to time new standards (e.g. more stringent MEPS levels) may be introduced and products registered to the old standard will need to have their registration approvals terminated when the new standards come into force? (Detailed below.)

4. Lifespan of a Registration

Another important question is to consider the definition of the lifespan for a product registration. Most jurisdictions impose a time limit on the validity of a product registration approval, although in rare cases (e.g. New Zealand) approvals never expire.

Typically, products remain in the retail market for 3 to 5 years before being replaced by a newer model so it makes sense to limit the life of an approval. After a set approval period (for example 5 years[2]) the records approval expires and generally that product will then no longer appear on any consumer listings of registered products (the record will however remain in the system but be tagged as "expired"). Naturally, the facility to re-register a previously registered product should be available to the registration holder, although in practice this is rarely used.

Apart from managing the ongoing process of record expiry, a Product Registration System also needs to manage transitions from an older standard to a newer standard (e.g. a newer standard might impose more stringent MEPS levels).

As soon as a transition to a new standard is formally announced, registration expiry dates for products registered to the "old" standard need to be set to the date that the new standard is to come into force. A schematic of this type of transition process is shown below.

[2] Two to three years is typical for most larger consumer products but some brands (usually high end brands) tend to have longer production runs. A five year life tends to cover most products lifespans in the market.

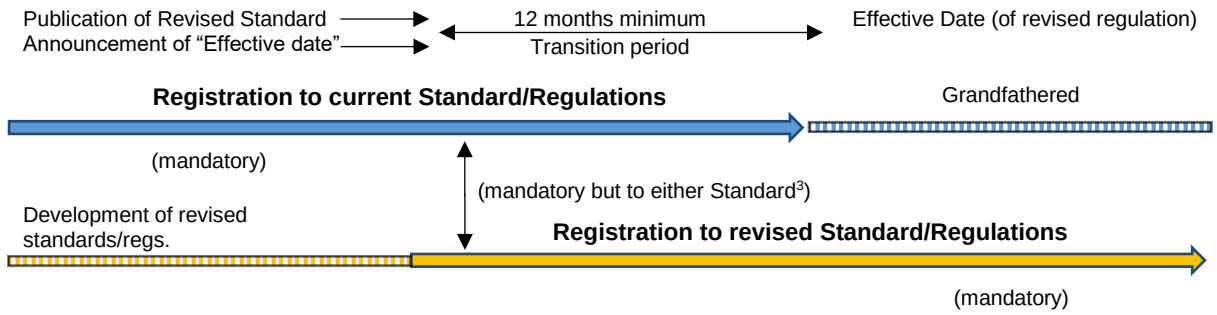


Figure 2: Example of a Transition Process from One Standard to a Newer Standard

5. Likely Activity Levels

Product Registration System developers need to gauge what the likely level of activity will be on the Product Registration System. Useful information for the developers may include the number of manufacturers/importers existing in the country, voluntary/mandatory nature of the standard, estimated number of appliances handled per manufacturer/importer, and expected public sessions per capita, based on previous countries experiences. The level of activity influences decisions regarding required staffing needed to support applicants and process their applications as well as required IT system capacity to process and store the data. During the introduction phase of a Product Registration System, manufacturers and importers may need to be guided in the application process. In this phase, any remaining bugs in the system are also identified, logged and submitted to the developers for fixing. This means that the support requirements in this initial phase tend to be higher than in the stable product registration phase. System hardware requirements will also change over time, as the registration system gets established in the country and the public awareness increases. The utilization of a cloud-based system allows for a simple expansion of the computing capacity, however comes at the cost of lower system control. Additionally, the level of activity will largely be governed by the number of product categories being regulated and the likely number of products within each category expected to constitute new offerings to the market each year.

A mature scheme servicing a single country and involving 20 - 25 product categories might field between 5,000 -20,000 new registration applications per year on average. Ideally, product registration systems should be scalable, particularly if they are to service a region rather than a single country.

6. Data Security

As noted, some data to be stored within a Product Registration System is likely to be commercially sensitive. This means that early in the planning process consideration needs to be given to how security will be maintained. The utilization of the Open Web Application Security Project (OWASP) Secure Coding Practices is recommended in the software development phase. These coding practices are internationally independently developed recommendations which aim to make sure that a software is developed in a secure way. Some elements that should be analysed include:

- How will user accounts be created, verified and approved? (System administrator protocols)
- Will encryption be used? (Particularly important if on-line fee payment is to be a feature.)
- How will usernames and passwords be managed?
- How will protection from web bots and hackers be achieved? (e.g. use of Captcha facility)

[3] During the transition period a supplier can register their product to either the old or the new standard at the end of the transition period all those products registered to the old standard have their registrations cancelled but with a right for remaining stock on the shelves to be sold out. Registrations to the new standard after the transition period remain valid.

- What back-up facilities will be provided both on-site and off-site? (e.g. A nightly full data backup on site to a separate drive, a monthly full data backup offsite plus nightly differential backup offsite)
- All system users should be subject to a time out (e.g. after 1 hour) if no activity
- Servers should run software firewalls to allow only required traffic (e.g. HTTP, FTP, RDC, MS SQL*)
- The registration system should maintain audit logs for logins
- Database external traffic should only to be allowed to specific IP addresses for management

7. System Features

Following are a list of commonly adopted system features applied in Product Registration Systems. The inclusion or exclusion of such features needs to be considered in advance of the development of a Product Registration System in consultation with relevant stakeholders.

Each feature below can potentially provide a benefit to Product Registration System users depending on the particulars of the scheme and the jurisdiction it serves. Naturally, each feature will add to the cost of the Product Registration System development so it is important to assure that the included features provide value for money.

The software development platform should require the programmers to follow a layer-based development with modules within each layer, in order to facilitate maintenance and upkeep of the Product Registration System, particularly if other development teams are contracted to perform those tasks. Mainstream web development platforms include .NET and J2EE.

7.1 Multiple language functionality

In jurisdictions or regions with different languages it can be important for a Product Registration System to deliver services in multiple languages. It is important to determine if this is the case or likely to be the case early on as it will impact how the Product Registration System web facility is structured. Product Registration Systems that are not designed for multiple languages may need to be re-built in circumstances where a need for multiple languages later becomes apparent. Naturally, there is no point in offering a particular language option on a Product Registration System unless there is staff within the regulators office that is competent in the languages provided.

7.2 Multiple users within one account

Basic product registration systems will provide capacity for a single account holder (applicant or regulator) to make or process applications in their own name. However, it is often the case that a product supplier or a regulator for that matter is part of a larger organisation that may have multiple officers responsible for creating/processing registration applications. In these circumstances it can be advantageous for an account holder to be able to set up "sub-accounts" (each with their own username and password) within their main account. All records in such an account are tagged with the same account number but a range of different users can enter and use the account.

In such a set-up, typically the primary user will have the capacity to manage the various sub-accounts including being able to set up new accounts for new sub-users and also to delete accounts.

7.3 Structured Access Privileges for Regulatory Officers

Where the program regulator who processes and approves applications operates some form of staged approval process involving a hierarchy of officers then separate accounts with different privileges may be a requirement. As an example there may be three levels of regulators account as follows:

- **Assessor** – has capacity to view records and make recommendations only for approval or otherwise.
- **Regulator** – has capacity to view records and approve or refuse/return an application.

- **Administrator** – has same capacity as the regulator but with the added privileges of being able to edit a record and to set up new regulator accounts or delete existing regulator accounts.

7.4 Mobile applications and use of Quick Response (QR) bar codes

For product registration purposes (i.e. as used by manufacturers, importers and regulators), desktop computer based applications are most appropriate. However, facilities intended for consumer use (i.e. to search and compare registered products) or for use by compliance officers in the field, mobile applications can be particularly useful (especially for comparisons in-store).

Where such simultaneous multi-platform applications are to be used, appropriate frameworks need to be selected (e.g. NET, MVC etc.)

QR (quick response) codes on energy rating labels affixed to appliances can also assist consumers and compliance officers to quickly identify floor stock and access relevant data using mobile applications enabled to read the QR codes.
In China for instance there is a smartphone app that allows shoppers to scan a QR code that is placed on the energy label itself (see image to the right) and is accessible via any other QRcode scanning app. Consumers are then directed to state authorised online content where they can access extended product information, media and consumer reviews. With the app, consumers are also able to compare annual energy consumption of products, find additional information and professional services and provide feedback to government agencies that administer the label

7.5 Search engines to locate data meeting selected search criteria

As stored records in a Product Registration System get larger and larger in number, the task of finding a particular record or cohort of records becomes more onerous. Inclusion of search engines to aid in this task can greatly assist users. Typically, search engines in Product Registration Systems allow users to set a range of search parameters (e.g. brand name, product category, registration status – see Figure 3) and then conduct a search to return only records that meet the selected search criteria. Searched records can then be viewed (along with any uploaded files), edited (where permitted), downloaded, printed or copied as required.

For applicant users the need for a search engine is primarily focused on searches of the various application forms they have prepared, whether they are initial drafts, submitted applications, approved applications or returned/refused applications.

For regulator users the need for search engines is broader than for applicant users. A regulator user may wish to search databases of:

- Applications (submitted for approval)
- Registered products (i.e. previously approved applications)

- Applicants (names, company details, contact details, etc.)
- Test laboratories (names, company details, contact details, etc.)

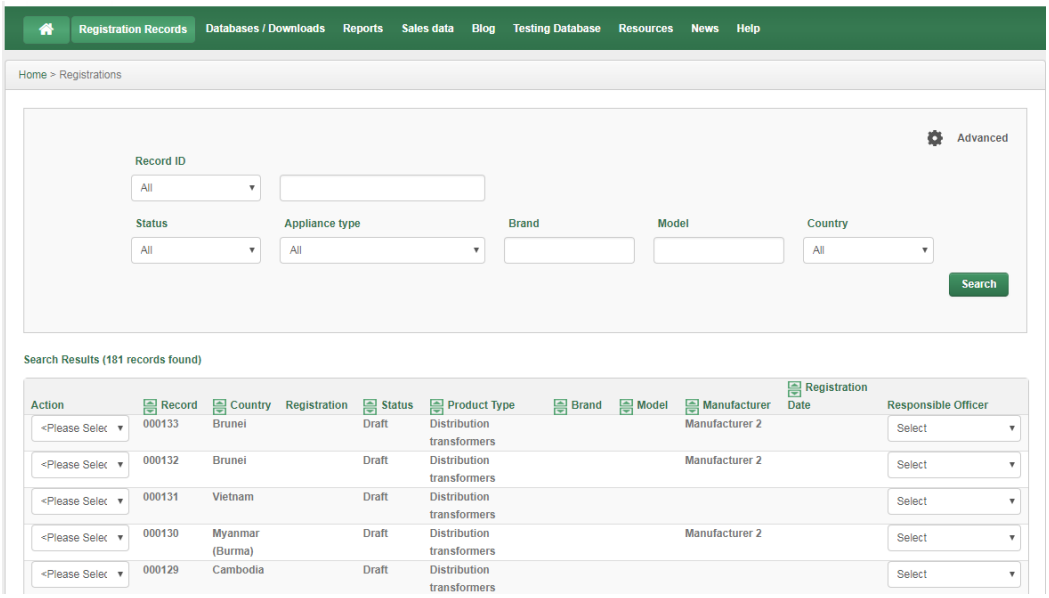


Figure 3: Figure 3: Example of a Registration Record Search Facility (UNEP Demonstration System)

7.7 Online fee payment facilities

Where product registration processes involve the payment of fees, the use of online payment systems can greatly streamline the management of such payments. Normally, applicants are directed to a payment portal at the end of the application process where they make their payment of the application fee via the regulators banking service provider. Typically, applications cannot be lodged with the regulator for approval until successful payment of the applicable fees has been made. Such systems can issue receipts to applicants and also provide complete and transparent records of all financial transactions relating to the Product Registration System.

7.8 Automated email notifications to system users

At various stages in the processing of data within a Product Registration System, a system of automated email notifications can be sent to either the regulator or the relevant applicant to keep them informed regarding the progress and status of product registration applications. Such notifications are usually issued upon:

- Activation of a user's account (sent to the applicant)
- Submission of a registration application (sent to the regulator)
- Completion of checking and or approval of an application (sent to the applicant)
- Return or refusal of an application (sent to the applicant)
- In advance of an impending expiry date of an approved application (sent to the applicant)
- Suspension, expiry or revocation of an approved application (sent to the applicant)

7.9 Automated approval certificate generation

Upon approval of a registration application by the regulator a Product Registration System can be set up to automatically generate a pdf approval certificate or "Letter of Authority". Approval certificates may be downloaded and or printed by applicants, regulators, customs officials, etc. Approval certificates typically incorporate some official text confirming the legal status of the product plus some key data extracted from the registration record such as:

- The approval number (plus other identifiers such as the Product Registration System record ID number)
- Applicant details (applicant's name and company name)
- Product type
- Product sub-category
- Date of issue of certificate
- Date of expiry
- Product details (brand and model)
- The applicable regulatory standard

7.10 Hard copy print facilities (e.g. for approval certificates)

All forms and certificates within the Product Registration System should include a facility that allows the user to print to pdf a copy of the particular form or certificate.

7.11 Document upload facilities

Apart from lodging an application for approval of a product under a standards and labelling scheme there are often a number of companion documents that are required to be lodged with the regulator as part of the application submission. A Product Registration System can include facilities whereby users can upload electronic copies of such documents. These documents are effectively attached to the registration application and can be downloaded by regulators, customs officials or even the original applicant if needed at some later date. Uploaded documents types can include:

- Company certificates
- Test Reports or declarations from conformity assessment bodies
- Images of energy rating labels
- Images of products
- Declaration forms (e.g. a declaration that a tested product is equivalent to the one being registered)
- Copies of receipt of payment of fees (where online payment systems are not used)
- Other uploads: e.g. instructions for use, image of product markings, statement of quality assurance

7.12 Facility to copy an existing record

This is a time saving feature designed for use by applicant users whereby a previously completed application can be copied (i.e. the values in an existing record are imported into the equivalent fields in a new record) and used as the basis for a second application for a similar product.

Additionally, the system may provide a bulk-upload feature. This allows applicants to request the registry of a set of products in one step, instead of filling out manually each form for each product.

7.13 Facilities to allow for the downloading of various datasets in CSV format

For policy analysts and regulator users in particular, facilities to download complete datasets available from within the Product Registration System databases can prove very useful. Such downloads to the users local hard drive are usually in the form of CSV files. The following record types are often seen as useful to download:

- Applicant names and contact details
- Brand names
- Product registration details (multiple product types)
- Data on numbers of sales/imports/manufacture (if collected)
- Test laboratories names and contact details

7.14 Automated report generation facilities

For programme managers the capacity to automatically generate reports from a Product Registration System can prove most helpful in meeting statutory reporting requirements. A range of report types can

be generated, including tables and related charts via queries applied to the various databases maintained within the Product Registration System. These reports are mainly statistical in nature and can cover such aspects as:

- Current status of selected record sets
- Number of product registrations approved per month (by product category)
- Average time taken to process applications for approval
- Registered product performance trends
  Sales weighted product performance trends (where sales data is collected)

7.15 Change tracking functions (traceability of activity on the system)

To assist in auditing and improve the transparency of a Product Registration System a system for logging changes to an input field can be included. Generally, only changes made post submission of a record need to be recorded. Such facilities typically record:

- The field name
- The initial input logged into the field (i.e. when it was submitted for the first time)
- Date and time of each change
- The user ID of who made each change
- The content of each change

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